Electronic Version

Stylesheet Version v1.1.1

Claims

[c1] What is claimed is:

1. A method of MR imaging comprising the steps of:
partitioning k-space into a number of partitions, wherein the partitions incrementally increase in distance from a center of k-space; and
applying magnetic preparation pulses and acquiring data such that a rate by which the magnetic preparation pulses are applied is a function of the incremental distance a partition of MR data is from the center of k-space.

[c2] 2. The method of claim 1 wherein the magnetic preparation pulses are saturation pulses, and further comprising the step of decreasing the rate by which the saturation pulses are applied as the distance a partition of MR data is from the center of k-space increases.

[c3] 3. The method of claim 1 further comprising the step of playing out at least one dummy acquisition after application of each magnetic preparation pulse.

[c4] 4. The method of claim 3 further comprising the step of playing out the magnetic preparation pulses every N_i TR

for an ith partition, wherein $N_1 < N_2 \ldots < N_{M-1} < N_M$, and M corresponds to the number of partitions.

[c5] 5. The method of claim 4 wherein the number of partitions includes three partitions for a given image acquisition, wherein N_i includes $N_1 < N_2$ and $N_2 < N_3$.

[c6] 6. The method of claim 5 wherein the step of applying magnetic preparation pulses includes the step of playing out fat saturation pulses every five TRs for the first partition, every 15 TRs for the second partition, and every 40 TRs for the third partition.

[c7] 7. The method of claim 1 further comprising the step of determining the number of partitions based on an FOV from which MR data is to be acquired.

[c8] 8. The method of claim 7 further comprising the step of determining the number of partitions to minimize k-space discontinuity between adjacent k-space views.

[c9] 9. The method of claim 1 wherein the magnetic preparation pulses are fat saturation pulses, and further comprising the step of maximizing fat saturation while minimizing differential weighting of k-space while acquiring central region k-space.

[c10] 10. The method of claim 1 wherein the data acquisition

in k-space includes a radial acquisition in k-space.

[c11] 11. An MRI apparatus comprising:
a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images; and
a computer programmed to:
partition k-space into a number of partitions, each having an increased distance from a center of k-space;
apply magnetic preparation pulses at a first rate during data acquisition for a first radial partition; and
apply magnetic preparation pulses at a second rate, different from the first rate, during data acquisition for a second partition.

[c12] 12. The MRI apparatus of claim 10 wherein the first rate and second rate are a function of partition distance from the center of k-space.
13. The MRI apparatus of claim 11 wherein the first rate is less than the second rate if the first radial partition is closer to the center of k-space than the second radial partition.

[c13] 14. The MRI apparatus of claim 13 wherein the satura-

tion pulse is a magnetization preparation pulse.

[c14] 15. The MRI apparatus of claim 10 wherein the computer is further programmed to play out a number of dummy acquisitions after each saturation pulse.

[c15] 16. The MRI apparatus of claim 10 wherein the saturation pulses include at least one of a fat saturation pulse, an IR pulse, and a spatial saturation RF pulse.

[c16] 17. The MRI apparatus of claim 10 wherein the computer is further programmed to determine dimensions of an FOV and, from the dimensions, determine a number of radial partitions such that discontinuities between adjacent k-space locations are reduced.

[c17] 18. The MRI apparatus of claim 10 wherein the computer is programmed to carry out an elliptical centric phase order acquisition of MR data from at least one of a heart region and an abdominal region of a patient.

[c18] 19. The MRI apparatus of claim 10 wherein the computer is programmed to partition k-space into partitions of similar size.

[c19] 20. A computer program representing a set of instructions that when executed by a computer causes the computer to:

partition k-space data into a number of partitions, each a given distance from a center of k-space; and

play out a magnetic preparation pulse at a different rate for each partition, the rate being dependent on the given distance a partition is from the center of k-space.

[c20] 21. The computer program of claim 20 wherein the set of instructions further causes the computer to define an elliptical centric phase ordered acquisition of k-space and wherein each partition is centered about a center of k-space such that magnetic preparation occurs more frequently during MR data acquisition of a partition closer to the center of k-space than that of a partition farther from the center of k-space.

[c21] 22. The computer program of claim 20 wherein the set of instructions further causes the computer to play out a number of dummy acquisitions following each magnetic preparation pulse.

[c22] 23. The computer program of claim 22 wherein the set of instructions further causes the computer to define boundaries of each partition and determine the number of partitions based on a k-space xtent of a 3D image FOV.

[c23] 24.T he computer program of claim 23 wherein the set

of instructions further causes the computer to define the boundaries and the number of partitions such that kd-space iscontinuity between adjacent kv-space iews is reduced.

[c24] 25.T he computer program of claim 20 incorporated into a computer data signal that is embodied in a carrier wave that is uploadable/downloadable to an MR apparatus.